Omnitron Systems Technology, Inc.

***iConverter*® 10/100 User Manual**

***iConverter* 10/100** Dual Fiber Modules				
Fiber Type	**Distance**	**Connector Type**		
		ST	**SC**	**LC**
MM	5 km	8380-0	8382-0	8386-0
SM	30 km	8381-1	8383-1	8387-1
SM	60 km	8381-2	8383-2	8387-2
SM	120 km	-	8383-3	8387-3

***iConverter* 10/100** Single-Fiber Modules			
Fiber / Connector Type	**Distance**	**Tx: 1310 nm, Rx: 1550 nm**	**Tx: 1550 nm, Rx: 1310 nm**
SM / SC	20 km	8390-1	8391-1
SM / SC	40 km	8390-2	8391-2
SM / SC	60 km	8390-3	8391-3

For wide temperature (-40 to 60º C), add a "W" to the end of the model number. Consult factory for extended temperature (-40 to +75º C) models. When using single-fiber (SF) media converter models, the Tx wavelength on one end has to match the Rx wavelength on the other.

ABOUT THIS MANUAL

This document supports revision xx/19 or later of the 10/100. This revision incorporates the following features:

1. Product support Flow Control via the on-board DIP-switch selections.

2. Symmetrical Fault Detection has been added to the module.

OVERVIEW

The *iConverter* 10/100 converters support the IEEE 802.3 Ethernet standard and convert between Ethernet 10BASE-T or 100BASE-TX unshielded twisted pair (UTP) and Fast Ethernet fiber 100BASE-FX. Models are available for multimode (MM) and single-mode (SM) dual fiber, and single-mode single-fiber.

The 10/100 supports Half-Duplex and Full-Duplex modes and features a crossover UTP switch for easy attachment to hubs, switches and workstations.

The 10/100 can be used as a standard two-port UTP to fiber converter. It can also use its two additional 10/100 backplane ports to connect to adjacent modules and accommodate flexible network configurations like In-Band management and multi-module configurations. The *iConverter* 19-Module, 5-Module or 2-Module Chassis have backplanes that facilitate connectivity between adjacent modules.

The 10/100 can be used in an unmanaged or managed fashion. When unmanaged, it can be installed in a chassis without an *iConverter* Network Management Module (NMM) or *iConverter* 10/100M. To be managed, an NMM module

or 10/100M module must be installed in the same chassis.

PORT STRUCTURE

Using a 4-port switch design, the 10/100 features a front-plane 10/100 UTP port, a front-plane 100Mbps fiber port and two 10/100 Ethernet backplane ports ("A" and "B") that can connect to adjacent modules within the same chassis.

When the 10/100 "A" and "B" ports are enabled (using the "BPOEN" DIP-Switch), they connect via the chassis' backplane to the slots on the left and right sides of the 10/100 module. When another switch-based module with backplane port connections such as a second 10/100 or an NMM is installed in an adjacent slot, it can be connected via the backplane to the 10/100 to facilitate a multi-module configuration.

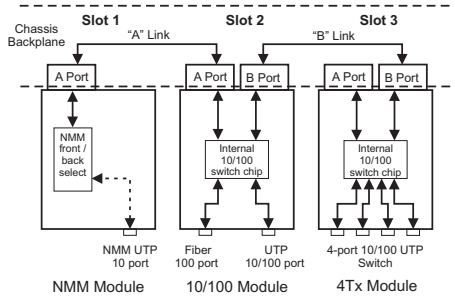

Fig. 1: 10/100 Application Example

Fig. 1 depicts a chassis with three modules plugged into three of its adjacent backplane slots. The adjacent slots are connected via the backplane using the "A" and "B" 10/100 links. In this example, the 10/100 in the center slot connects to the slot on its left using the "A" link and to the slot on its right using the "B" link.

In this example, the module on the left is a Network Management Module (NMM) and it connects via its A backplane port to the 10/100 facilitating "In-Band" management (via the fiber uplink). The module on the right is a 4-port 10/100 switch module (4Tx) and it connects via its B backplane port to the 10/100 facilitating a 5-port 10/100 Ethernet switch with a fiber uplink configuration. This 3-module configuration provides an effective 5-port 10/100 managed switch with a fiber uplink configuration.

This example shows how the 10/100 can be used either as a traditional managed or unmanaged media converter or to create flexible and effective network switch configurations.

For more information about individual chassis A and B backplane links, please refer to the specific chassis user manual.

LINK MODES

In order to accommodate different user needs, the 10/100 supports four different linking modes (see Fig. 2).

In Link Segment (LS), a port transmits a Link signal independently of any received Link at any other port. For example, the UTP transmits a Link regardless of the fiber receiving a Link [Fig. 2(a) & (b)].

In Link Propagate (LP), a port transmits a Link signal only when receiving a Link at its other port. For example, the UTP transmits a Link only when receiving a Link at the fiber port [Fig. 2(c)].

In Remote Fault Detection + Link Propagate (RFD+LP), the UTP port transmits a Link signal only when receiving a Link at the fiber port. The fiber port transmits a Link signal only when receiving Link signals at both the fiber port and the UTP port. As a result, fiber faults (no Link received at the fiber) are propagated forward and looped back for fault reporting at both the network core and the customer location [Fig. 2(d)].

In Symmetrical Fault Detection (SFD), the UTP port transmits a Link signal only when receiving a Link at the fiber port. The fiber port transmits a Link signal only when receiving a Link signal at both the fiber port and the UTP port. As a result, fiber faults (no Link received at the fiber) are looped back and can be reported to the network core. In addition, connecting two back-to-back converters which are both set to SFD facilitates dual-loop-back, where fiber faults are reported to both ends of the network. A blinking fiber link LED on a converter indicates a fault of the transmit fiber or UTP cables of that converter [Fig. 3(e)].

NOTE: Connecting two converters with both set to RFD mode is not supported and will cause a lockup.

NOTE: Converters in SFD mode must be deployed in pairs.

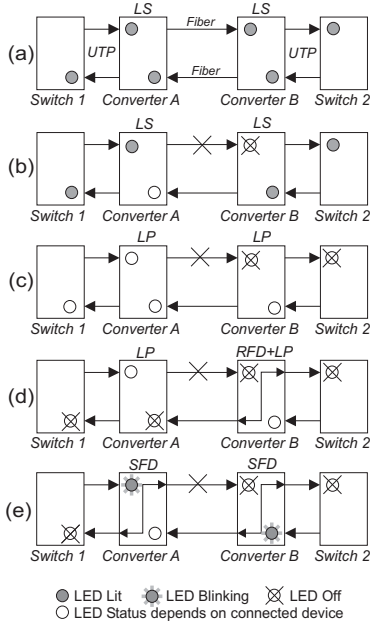

Fig. 2: 10/100 Link Modes

DIP-SWITCH SETTINGS

Front Panel DIP-switch Settings

Fiber Full-Duplex = FDX
HDX = Fiber Half-Duplex
UTP Auto Negotiate = AN
Man = UTP Manual
UTP 100Mbps = 100
10 = UTP 10Mbps
UTP Full-Duplex = FDX
HDX = UTP Half-Duplex

Fig. 3: Front-Panel Dip Switches

Fiber Full/Half-Duplex "FDX/HDX" DIP-switch

When in the Fiber Full/Half-Duplex DIP-switch is in the Fiber Full-Duplex "FDX" position (factory setting), the fiber port operates in Full-Duplex mode. When in the Fiber Half-Duplex "HDX" position, the fiber port operates in Half-Duplex mode and its distance is limited by the IEEE 802.3 standard to 412 meters.

UTP Auto/Manual Negotiate "AN / MAN" DIP-switch

When the UTP Auto/Manual Negotiate DIP-switch is in the UTP Auto-Negotiate "AN" position (factory setting), the converter auto-negotiates and matches the 10/100 speed and duplex mode of a mating auto-negotiating device connected to its UTP port.

When the UTP Auto/Manual Negotiate DIP-switch is in the UTP Manual "Man" position, the converter does not auto-negotiate and operates in the mode selected by the Full/Half Duplex "FDX/HDX" and "10/100" DIP-switches.

UTP 10/100 DIP-switch

When the UTP Auto/Manual Negotiate DIP-switch is in the UTP Manual "Man" position, the UTP "10/100"

DIP-switch selects the speed of the UTP port. When in the "100" position (factory setting), the UTP port operates at 100 Mbps. When in the "10" position the UTP port operates at 10 Mbps.

UTP Full/Half-Duplex "FDX / HDX" DIP-switch

When the UTP Auto/Manual Negotiate DIP-switch is in the UTP Manual "Man" position, the UTP Full/Half-Duplex "FDX/HDX" DIP-switch selects the duplex mode of the UTP port. When in the Full-Duplex "FDX" position (factory setting), the UTP port operates in Full-Duplex mode. When in the Half-Duplex "HDX" position, the UTP port operates in Half-Duplex. Set the duplex mode to match the connecting device and check for link status.

Note: Attaching an auto-negotiating UTP port to a non-auto-negotiating (manual / forced / hard-coded) UTP port may result in an unpredictable port setting with excessive collisions and poor link performance. When operating in Manual mode, both mating ports MUST be set manually to the same speed and duplex mode.

RJ45 Crossover Push Button Switch (not shown)

When connecting the UTP to a hub or switch, set switch to "Straight-Through" (factory setting). When connecting to a workstation, set to "Crossover."

BOARD MOUNTED DIP-SWITCHES

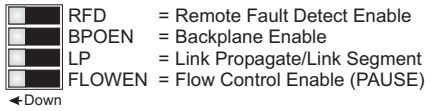
4 RFD = Remote Fault Detect Enable
3 BPOEN = Backplane Enable
2 LP = Link Propagate/Link Segment
1 FLOWEN = Flow Control Enable (PAUSE)
◄Down

Fig. 4 Board Mounted DIP-Switches

LINK MODES (SW4 and SW1)

The module supports multiple link modes for fault detection and isolation. Link Segment should be used for the initial installation of the module. Once installed and operational, the link mode can be modified.

Link modes are controlled by DIP-switch 2 and 4.

SW2 (LP)	SW4 (RDF)	FUNCTION
DOWN	DOWN	Link Segment (LS)
UP	DOWN	Link Propagate (LP)
DOWN	UP	Remote Fault Detect + Link Propagate (RFD+LP)
UP	UP	Symmetrical Fault Detect (SFD)

"BPOEN" A and B Backplane Enable DIP-Switch

When the A and B Backplane Enable "BPOEN" DIP-switch is in the UP position, both the A and B backplane ports are enabled and connect to the backplane to facilitate In-Band management. When the "BPOEN" switch is in the DOWN position (factory setting), both ports are disabled and disconnected from the backplane.

"FLOWEN" Flow Control (PAUSE) DIP-switch

When the Flow Control "FLOWEN" DIP-switch is in the UP position, flow control functionality is enabled. When the module is configured for FDX, PAUSE functionality is enabled. When the module is configured for HDX, jam functionality is enabled. When flow control is enabled, a port will generate either a pause or jam frame when internal resources are not available to receive the next incoming frame.

When the DIP-switch is in the DOWN position (factory default), flow control is disabled.

LED INDICATORS:

LED	COLOR	DESCRIPTION
Power	Yellow	On - Power
Fiber FDx:	Green	On - Full-Duplex selected
F/O Link:	Green	On - Link Rapid Blinking - activity 0.5Hz blinking - SFD error detected
UTP Auto:	Green	On - Auto-Negotiation enabled
UTP 100:	Green	On - 100 Mbps link
UTP 10:	Green	On - 10 Mbps link
UTP FDx:	Green	On - Full-Duplex detected Blinking - Collision in HDx mode
UTP Link:	Green	On - Link Rapid Blinking - activity 0.5Hz blinking - SFD error detected

MOUNTING AND CABLE ATTACHMENT:

iConverter modules are hot-swappable and can be installed into any chassis in the *iConverter* family.

1. Carefully slide the *iConverter* module into the installation slot, aligning the module with the installation guides.
   NOTE: Ensure that the module is firmly seated against the backplane.
2. Secure the module by securing the panel fastener screw (attached to module) to the chassis front.
3. Attach the UTP port via a category 5 cable to a 100BASE-TX or 10BASE-T Ethernet device.
4. Attach the fiber port via an appropriate multimode or single-mode fiber cable to a 100BASE-FX Ethernet device. The *iConverter* transmit (Tx) must attach to the receive side on other device; the receive (Rx) must attach to the transmit.
5. When using single-fiber (SF) media converter models, the Tx wavelength on one end has to match the Rx wavelength on the other. Note that based on this guideline, the SF media converter models must be used in pairs, such as the 8390-1 matched with the 8391-1.

SPECIFICATIONS

Model Type	**10/100**
Protocols	100BASE-FX, 10BASE-T, or 100BASE-TX
Frame Size	up to 1,536 bytes
UTP Connectors	RJ-45
Fiber Connectors	SC, ST, LC Single-Fiber SC
Controls	UTP X-over, LS/LP, RFD, SFD, Auto/Man, 10/100, FDX/HDX, Flow Control
LED Displays	Power, F/O FDX/HDX, FO link activity, Auto, FDX/HDX, 10, 100, UTP link activity,

SPECIFICATIONS

Dimensions	W:0.850" x D:4.5" x H:2.8"
Weight	8 oz.
Compliance	UL, CE, FCC Class A, NEBS Level 3
Power Requirement	0.95A @ 3.3VDC (typical)
Temperature	Standard: 0 to 50º C Wide: -40 to 60º C Storage: -40 to 80º C
Humidity	5 to 95% (non-condensing)
Altitude	-100m to 4000m
MTBF (hrs)	1,050,000

Warning

The operating description in this Instruction Manual is for use by qualified personnel only. To avoid electrical shock, do not perform any servicing of this unit other than that contained in the operating instructions, unless you are qualified and certified to do so by Omnitron Systems Technology, Inc.

Warranty

This product is warranted to the original purchaser against defects in material and workmanship for a period of TWO YEARS from the date of shipment. A LIFETIME warranty may be obtained by the original purchaser by REGISTERING this product with Omnitron within 90 days from the date of shipment. TO REGISTER, COMPLETE AND MAIL OR FAX THE ENCLOSED REGISTRATION FORM. Or you may register your product on the Internet at www.omnitron-systems.com. During the warranty period, Omnitron will, at its option, repair or replace a product which is proven to be defective.

For warranty service, the product must be sent to an Omnitron designated facility, at Buyer's expense. Omnitron will pay the shipping charge to return the product to Buyer's designated US address using Omnitron's standard shipping method.

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate use and/or maintenance of the equipment by Buyer, Buyer-supplied equipment, Buyer-supplied interfacing, unauthorized modifications or tampering with equipment (including removal of equipment cover by personnel not specifically authorized and certified by Omnitron), or misuse, or operating outside the environmental specification of the product (including but not limited to voltage, ambient temperature, radiation, unusual dust, etc.), or improper site preparation or maintenance.

No other warranty is expressed or implied. Omnitron specifically disclaims the implied warranties of merchantability and fitness for any particular purpose.

Exclusive Remedies

The remedies provided herein are the Buyer's sole and exclusive remedies. Omnitron shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any legal theory.

TECHNICAL SUPPORT:

For help with this product, contact our Technical Support:

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Fax: (949) 250-6514
Address: Omnitron Systems Technology, Inc.
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Irvine, CA 92618 USA
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